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TASKS OF THE PETROLEUM INDUSTRY IN THE POLISH FIVE-YEAR PLAN

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The Five-Year Plan now being worked out for the petroleum industry is a plan for the liquidation of the backwardness of the petroleum industry in relation to other key Polish industries, a plan for introducing new and progressive technical methods, for developing new prospecting techniques and new and progressive technological methods in the processing of crude oil; it is a plan for introducing great material resources, which should serve to make up for the neglect of the recent periods and to attain a considerable rise in all technical and economic indexes. This should bring the results obtained by the Polish petroleum industry close to those obtained by the leading petroleum industries on a worldwide basis.

The basic task of the petroleum industry is to supply the national economy of the young Polish People's State with the indispensable petroleum products, such as liquid fuels, lubricating oils and greases, asphalt, paraffin, and other petroleum derivatives, as well as with natural gas and gasoline.

As a heritage from the capitalist management, Poland had a very low degree of motorization, which affected the level of consumption of petroleum products. The rapid rate of industrialization during the past decade, along with development of motorization and electrification, and the increasing mechanization of agriculture, all contributed to the considerable increase in consumption of petroleum products, which was 4 times as large in 1955 as it was in 1940.

Unfortunately, the petroleum industry has not kept pace with the increased need in this area. While in the first year of the Six-Year Plan crude oil production amounted to 24% of the petroleum products consumed in Poland, this figure dropped to only 11% in the last year of the Six-Year Plan. The output of Polish refining plants has remained at an even level and has even grown somewhat, but not sufficiently to meet the country's needs. In 1950, 40% and in 1955, 42% of the demand for such products was met by Polish plants.

This lag of the petroleum industry, particularly in the area of crude oil production, becomes all the more disquieting if one considers that in the last year of the Five-Year Plan, consumption of petroleum products is to be almost doubled, as compared with 1955.

Workers of the petroleum industry can draw only one conclusion from these facts: the greatest efforts must be made to increase crude oil production manifold. The processing capacity of the refining plants must also be increased considerably, even if they must for the time being operate with inferior raw materials.

This is a very difficult task, since Poland does not possess, at present, sufficient discovered geological resources of petroleum oil and natural gas which would make it possible to increase their production. Insufficient emphasis has been placed during the past decade on work designed to increase these known geological resources, as a result of which the relative supply of these products has not only failed to increase in relation to the demand, but is constantly diminishing.

One of the primary tasks of the petroleum industry in the Five-Year Plan will therefore be to find new rich petroleum and natural gas deposits. In recognition of the importance of these problems, the Party and the Government have appropriated enormous resources for this purpose. These will make it possible to develop large-scale geological prospecting.

The success of this prospecting work will be facilitated, not only thanks to the quantitative increase, but primarily thanks to fundamental changes in the geological and technical design. Three basic factors should be mentioned in this connection, namely:

1. the extension of prospecting to new regions of Poland, not hitherto investigated for the presence of oil and gas
2. the geological prospecting work to be based on geophysical methods
3. the introduction of new techniques and modern technological methods of drilling

In contrast to the prospecting conducted hitherto, which was confined to the relatively narrow region of the Karpat Mountains, this will be extended to the vast spaces of the Polish Lowlands, during the Five-Year Plan. This will apply particularly to the western and northwestern regions and to the Przedgórze Karpat. This idea which was approached rather timidly by Polish geologists, at first, has finally been accepted as a correct approach. The first towers and masts of drilling installations made their appearance in the Polish Lowlands as early as 1955. This does not mean that prospecting in the Karpat Mountains will be given up completely during the Five-Year Plan. Work on the solution of a few of the most important geological problems will be continued there; in case of positive results, these will contribute importantly to the rejuvenation of the Karpat petroleum industry. The basic emphasis, however, will be placed on prospecting in new regions, during the Five-Year Plan. The proportion of planned drillings illustrates this; 75% of all geological prospecting drilling will be carried out in the Polish Lowlands.

Hitherto, geological studies were based primarily on costly deep drillings with only weak preparation by means of structural drillings, and almost no prior geological research. A basic change will be made during the Five-Year Plan, in this respect. Before starting on deep drillings, large-scale geophysical studies will be carried out, and a larger number of structural drillings will be made than has been the practice hitherto. Petroleum prospectors will obtain a powerful tool in the form of better methods. These methods will make it possible to discover quickly and inexpensively those structures which might yield oil deposits when subjected to drilling. Polish geologists should learn to trust these methods, to use them skillfully, and to be guided by them, thus shortening the prospecting cycle as much as possible.

The petroleum industry therefore has great tasks in the area of organizing and expanding the geophysical service during the Five-Year Plan, particularly in relation to methods of prospecting. The range of seismic equipment for the petroleum industry should be seven times as large as in 1955, as compared to 1955. This will become possible thanks to technical aid from the Soviet Union, which will supply seismic apparatus and will send Soviet experts, it will nevertheless require tremendous effort, especially as concerns the training of new cadres for the industry. The fact that the petroleum industry has taken over the geological service and its further development from the Central

Administration for Geology places a serious responsibility on Polish seismists, who must utilize effectively the valuable seismic equipment for a geological study of Poland to determine the presence of oil and gas deposits.

The petroleum industry faces important tasks in the area of geological prospecting drilling, the number of which is to increase by over 55% during the Five-Year Plan as compared to the Six-Year Plan. The correct principle of increasing the share of structural drilling has been accepted in this connection; while structural drilling constituted about 30% of the total during the Six-Year Plan, it will constitute about 45% of the total in the Five-Year Plan. This principle conforms to the premise that depth drilling should be carefully prepared; since this is the most expensive type of drilling, it should not be used extravagantly. This does not mean, however, that after careful preparation by geophysical research only structural drilling, depth drilling should not be widely used. The practice which has often been applied in the Polish petroleum industry of drilling single wells in a given structure, and waiting until the next ones until the results of the first were known, caused extensive delays and involved a decentralization of drilling which increased its costs.

The rapid, correct, and effective execution of the tasks in the field of drilling will be possible only if new technical equipment is obtained and if new drilling methods are introduced. In this connection, the following steps should be taken during the Five-Year Plan:

1. Structural drilling should be given up completely and modern rotary drilling equipment should be used. Drilling equipment should be standardized. As soon as possible at 5 to 6 types of drills which would cover all ranges of depth; these should replace the 18 types now in use.

2. Drilling tools should be improved; this applies particularly to biting and scraping roller-drill bits, adapting their construction and materials to the different degrees of hardness of rocks to be pierced.

3. The turn-of-worm method of drilling should be introduced and mastered.

4. The drill and rinser should be improved; in this connection, a plant should be built for the production of powdered clay of the bentonite type.

5. The drilling man should be improved, the management of rinser pipes rendered more efficient, and the building and equipping of pipe bases should be improved. A new type of switch should be introduced, which can be connected to the pipes by contact, with the help of electric heating.

6. The application of rapid drilling methods should be broadened, with the introduction of variables for pressure, revolutions, and rinsing.

7. Specialization of drilling operations should be started, particularly in the area of installing and withdrawing the drilling man.

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8. The process of assembling, disassembling, and transporting the installations should be speeded up and rendered more efficient by the application of block assembly, mechanized operations, and by the proper choice of means of transportation.

The fulfillment of the tasks in the field of drilling technology should serve to increase the mechanical speed of drilling, shorten the duration of related operations, and lower considerably the frequency of breakdowns, thus making for industrial progress in drilling amounting to about 17% in 1955 as compared to 1955.

The work in the field of mining geophysics is an important factor which has a decisive effect on the utilization of the drillings and on the correct interpretation of their results. The Enterprise for Geophysics will have the task of introducing new methods into this area and of improving those which have previously been used. The integrated application of several methods of drilling should be introduced. For example, besides the electrical method, gamma, neutron, or continuous gas drilling should be used. The interpretation of the graphs should be perfected to a considerable degree. The experience of the Soviet Union and other countries, relating to the utilization of isotopes for research purposes, should be utilized.

In the question of exploiting oil and gas deposits, it should be stressed that in this area the tasks of the petroleum industry, though limited, are nevertheless rather difficult ones. In working out the Five-Year Plan, the principle of limiting the planned exploitation to known oil fields which are already in use has been accepted. This made it impossible to plan for increased output for the next 5 years. However, even the task of maintaining crude oil production at a certain level will require considerable effort on the part of the workers at the oil fields. These efforts should take the following 3 main directions:

1. Optimal production conditions should be maintained for each oil well by constant attentive watching of the output and by determining the operating parameters through frequent measurements.

2. The various methods of exploitation should be widely used, and special attention should be given to the flow of oil to the well should be performed. In addition, the various methods, water flooding should be introduced, and the method of hydraulic separation should be introduced and perfected.

3. Wells of the A<sub>2</sub> category should be drilled and their effective exploitation should be started. Since the resources of the A<sub>2</sub> category are rather small, the number of oil wells planned for the Five-Year Plan will be rather small. Drilling of wells for exploitation will constitute only a small part of the drilling planned for the Five-Year Plan. The location of the wells should therefore be chosen all the more carefully. Drilling of wells in the oil fields, where not only negative results could be obtained but the maximum yield per meter of drilling would be obtained, should be uncovered either in the Karpat Mountains or in the Lowlands. The scope of oil-well construction would therefore be rather small.

The tasks mentioned above for petroleum oil in this article applies also to natural gas. As far as prospecting and as far as exploitation is concerned, the same principles are planned for the Polish Lowlands and the Karpat Mountains, aimed at uncovering both oil and gas. In addition,

about 10 percent of all drilling efforts designated specifically for prospecting for gas in the Podgorze Karpat. About 30% of the drilling for exploitation will be designed to produce gas. All workers of the petroleum industry should realize that natural gas is as valuable a raw material as oil, and the tasks relating to prospecting for and exploitation of natural gas deposits must be treated as seriously as those concerning petroleum oil.

The refining industry, which is the second large branch of the petroleum industry, also faces important tasks in the Five-Year Plan. These consist of providing Poland with the largest possible quantities of as complete an assortment as possible of petroleum products. During the past 6 years the old Polish refining plants have increased their processing capacity by close to 2.5-fold, with relatively low expenditures. These plants completed their Six-Year Plan goals by the middle of 1955. However, the capacity for finalization of petroleum products did not keep pace with the capacity for processing the raw material. As a result, the potential for obtaining the most refined and valuable products from crude petroleum has not been utilized to the fullest extent.

The tasks within the Five-Year Plan will therefore include the expansion and modernization of old refining plants, aiming primarily at the full finalization of production, with a relatively low increase in its volume. The quantitative increase is to amount to no more than 35% as compared to 1955. In addition to building more pipe-tower installations for distilling crude oil, the main emphasis will be on building modern installations for the finalization of oils, such as for selective refining of furfural, for de-paraffinization by means of acetone-benzol solvents, and for refining by the "Filtrol" contact method. The number of selectively refined oils will increase by over 120% in the Five-Year Plan, and will constitute about 40% of the total amount of refined oils produced (as against 20% in 1955). Poland's demand for high-quality motor oils will be met by this production. In addition, the old refining plants face the following tasks: to increase considerably production of solid asphalts and paraffins; to increase the assortment and quantity of solid lubricants; to increase the production of regenerated used oils by about 50% and to improve the quality of the regenerated products. The steam boilers and power plants should be modernized at the old refining plants, in order to attain savings in fuel consumption; installations for the complete purification of drain water should be built; the management of hard and soft water for technological use should be made more rational; asphalt-pouring operations should be mechanized, as should the loading of asphalt and paraffin; finally, all available means should be used to combat corrosion of the refining apparatus.

The building of a new, modern refining plant with a larger processing capacity than that of all old refining plants jointly will require an enormous effort from the refining industry. This plant is to start operating after the completion of the Five-Year Plan. It will make it possible to cover a larger proportion of the domestic market with Polish products, which is desirable from the viewpoint of trade balance, even if imported raw materials are used.

It is clear that the refining industry faces very serious tasks during the Five-Year Plan, both in the area of production and technical development, and above all, in the area of investments. These tasks will require a mobilized effort on the part of all workers of this industry.

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Faster consumption of petroleum products expected to be nearly doubled in 1960 compared to 1955 imposes difficult tasks on the distributor of these products. Namely, the Central Administration for Circulation of Petroleum Products (CZOPN). A constantly increasing volume of goods will be received from all sources, i.e., domestic production and imports, and they will have to be distributed through a vast regional wholesale and retail network. The demand for uniformity in rate of delivery, especially as concerns imported goods, will have to be compensated by means of central warehouse supplies. The capacity of the central warehouses would need to be almost doubled during the Five-Year Plan. The expansion of storage facilities will become the primary tasks faced by CZOPN. This includes the storage of goods in warehouses, in loading stations, as well as suitable increases in capacity of railroad and truck transportation for these products. Certain technical problems are awaiting solution, e.g., the substitution of reinforced concrete for metal storage tanks, the replacement of old manual distribution stations by modern metered ones, the reduction of losses of petroleum products, etc.

In the part of the machine industry a great effort will be required, if the program of the basic industries subject to the Central Administration for Petroleum Products is to be carried out. The Glinik Machines and Drilling Equipment Plant should provide the petroleum industry with the needed equipment for mining and for exploiting oil wells. The production of transportation drilling installations for wells up to 650 m in depth, which is to begin in 1956, and of heavy installations for drilling up to 3,500 m in 1960 are of primary importance. There should be a simultaneous increase in the production and an improvement in the quality of biting drills and of the drill bits. The production of these should be more than doubled. Production of rotary zworniki and ballasts should also be more than doubled. Production of automatic lifts and of eccentric "rotary lifts" to be used in exploiting the oil wells, must be started.

The production of the Glinik plant should increase by nearly 100% by 1960 compared to 1955. This can be attained if the planned investments are carried out, work organization is rendered more efficient, the machine plant is utilized more fully, and work productivity is increased by more than 40 to 45 %. The Machine Plant should turn particular attention to the matter of improving the quality of the machines, installation and equipment it produces, since this has a decisive effect on the work of the entire petroleum industry. The quality of the drilling installations and equipment is of particular importance, since it determines not only the drilling costs of drilling, but often also the fate of a well which may cost several million zlotys. Defects in the installations and equipment often cause breakdowns, which may lead to the loss of the entire well.

The Machine Plant should improve the construction operations, introduce modern technological methods, set up testing units, provide its measuring and testing laboratory with the necessary equipment, and sharpen supervision and technical control, in order to attain the necessary increase in production in its production, while at the same time lowering costs.

The investments to confront the petroleum investment enterprises Naftobudowa [Petroleum Construction] and the designing bureaus may be deduced from the planned investments planned for the resort of the Central Administration for Petroleum for the 1956-1960 Five-Year Plan. Suffice it to say that the investment outlays in each year of this period are, on the average, as large as the outlays made in 1955.

The Piotrkowska enterprise will carry the entire burden of expanding the old refining plants, and partly of building the new one, and of all building operations for the petroleum industry with the exception of drilling. This means that it must expand its work potential, especially in the area of assembling refining apparatus. A rapid increase in this potential can be attained by means of suitable equipment, by means of proper selection of work crews, and by improving their specialized training.

The designing bureaus are faced with important tasks. In principle, these bureaus should meet the needs of all branches of the petroleum industry and of GOSPLAN in the realm of designing and cost-estimate documentations for all investments planned within the Five-Year Plan.

The Petroleum Institute should be even more closely joined into the effort to carry out the tasks confronting the petroleum industry. Its research program within the Five-Year Plan must be made up of those scientific and technical problems which the industry is waiting to have resolved. The institute should collaborate as closely as possible with the petroleum and refining industry, be acquainted with all their difficulties and sore spots, including both the large basic problems and the minor daily ones. The institute should, in its research, anticipate the needs of the industry; it should show initiative in introducing technical progress, and should present to the industry with complete, solidly worked out solutions to the troublesome problems of the latter. Only under those conditions will the work of the institute be of practical advantage to the industry, and only then will it be possible to bring scientific achievements into the work organization and technology of the Polish petroleum enterprises.

In accordance with the tasks confronting the petroleum industries, the Institute should concentrate its work on problems of geological prospecting, of drilling, and of refining crude oil. The building of the Enterprise for Petroleum Technology, planned in the Five-Year Plan, will make it possible to develop a wide scope of research work relating to the petroleum refining industry. All other enterprises of the Institute should be directed towards work on the problems of prospecting and drilling, since these will be the major tasks of the petroleum industry in the Five-Year Plan.

The reduction of real costs is an important task, and the efforts of all enterprises subject to the Central Administration for Petroleum should be directed in this direction. The cost of processing one ton of raw material will be reduced only slightly at the oil refining plants, as a result of the more complex technological treatment of the crude oil in the future installations for finalizing oil, which will be built during the Five-Year Plan. However, this should result in an increase in the value of the products obtained from one ton of crude oil, amounting to at least 15 to 20%.

There is a good deal to be accomplished in the field of costs, where drilling is concerned. A reduction of no less than 25 to 30 percent in the costs per meter of drilled depth should be achieved by means of a more efficient work organization, modern equipment and methods, and by avoiding breakdowns.

The tasks of the Five-Year Plan will be realized by the workers of the petroleum industry.



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The petroleum industry possesses effective and devoted workers, who will not disappoint it in carrying out the Great Plan.

The project of the Five-Year Plan for the petroleum industry has been received with enthusiasm by the petroleum workers, is being widely discussed, and corrected with care so as to make it as effective as possible.

Polish petroleum workers believe that the Five-Year Plan will satisfy their ambitions, and that its execution should insure to the Polish economy a better supply of liquid fuels and oils than was hitherto available.

The execution of the Five-Year Plan will require devoted labor on the part of all petroleum workers, and the liberation of their creative initiative. It will require the introduction of the newest techniques, the constant improvement in skills, and a daily struggle to continue improving the technical and economic indexes relating to all activities and to all work posts.

The current discussion over the Five-Year Plan indicates that Polish petroleum workers, i. e., scientists, engineers, and technicians, are approaching these tasks as knowledgeable, careful managers, and that they will carry out their tasks with distinction.

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